

PRODUCTION OF POLYCRYSTALLINE SILICON

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Abstract

PURPOSE: To prevent the flocculation of silicon particles even under the conditions of a high monosilane concn. and high reactivity and to enable the stable continuation of reaction over a long period of time by providing a collision material within a fluidized bed reactor and dashing and crushing the formed flocs of silicon particles against this collision plate.

CONSTITUTION: Seed silicon particles having 50 to 300µm average grain sizes are packed from an introducing pipe 6 into the fluidized bed reactor 1. The monosilane is introduced together with a diluting gas (hydrogen or/inert gas) from an introducing pipe 5 into the reactor to fluidize the silicon particles. The fluidized bed is formed to a height of 3 to 10 times the inside diameter of the reactor. The fluidized bed is heated to 600 to 800 deg.C by a heater 4 for heating to thermally decompose the monosilane and to deposit silicon on the silicon particles. Further, the average grain sizes are adjusted to 300 to 1500µm while the seed silicon is introduced from the introducing pipe 6 into the reactor. While one piece of the bar-shaped collision material 3 erected and fixed in a perpendicular direction is provided in this embodiment plural pieces thereof may be provided at need. The reaction pressure is 0 to 5Kg/cm²G and the concn. of the monosilane in the diluting gas is 5 to 50%.

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